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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/904,348	07/12/2001	Patrick Toomey	9925/34713	1560

24728 7590 10/23/2002

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EXAMINER

WASHBURN, DOUGLAS N

ART UNIT PAPER NUMBER

2863

DATE MAILED: 10/23/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/904,348

Applicant(s)

TOOMEY, PATRICK

Examiner

Douglas N Washburn

Art Unit

2863

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 September 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10, 13-15, 24-65, 67-72 and 74-93 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10, 14, 15, 24-44, 46-65, 67-72, 74-81, 85, 86 and 88-93 is/are rejected.
- 7) ☒ Claim(s) 13, 45, 82-84 and 87 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 13 September 2002 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1 Applicant has cancelled claims 11, 12, 16-23, 66 and 73.

Applicant has amended claims 1-4, 14, 25, 27, 29, 31, 57, 59, 61 and 63.

Claim Objections

2 Claims 13, 45, 82-84 and 87 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 13 depends directly or indirectly from claim 1.

Claim 45 depends directly or indirectly from claim 32.

Claims 82-84 depend directly or indirectly from claim 64.

Claim 87 depends directly or indirectly from claim 64.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3 Claims 1-10, 14, 24-44, 46, 48, 51-65, 67-72, 74-76, 80, 86, 88, 92 and 93 are rejected under 35 U.S.C. 103(a) as being unpatentable over Webster (US 5,679,899)(Hereafter referred to as Webster) in view of Savage (US 4,128,011)(Hereafter referred to as Savage).

Webster teaches:

A method for determining structural integrity comprising:

Optically sensing vibration from a structure in regard to claims 1, 32 and 64

(e.g.; column 1, lines 4-11; Figure 1);

Determining whether a fault exists in a structure based on optically sensed structural vibrations regarding claims 1, 32

(e.g.; column 1, lines 4-11; Figure 1);

Generating a laser beam and transmitting a laser beam toward a structure in regard to claims 2, 33, 34

(e.g.; column 2, lines 58-64; Figure 1);

Receiving a reflected laser beam from a structure regarding claim 2, 33, 34

(e.g.; column 2, lines 58-64; Figure 1);

Detecting Doppler shift in a received laser beam relative to a transmitted laser beam in regard to claim 2

(e.g.; column 2, lines 58-64; Figure 1);

Determining at least one or both peak displacement and velocity of a vibration in regard to claims 2, 33 and 34

(e.g.; column 2, lines 58-64; Figure 1);

Sensing peak displacement of a vibration from at least one portion of a structure in regard to claim 3, 5, 36 and 67

(e.g.; column 2, lines 58-64; Figure 1);

Sensing peak velocity of a vibration from at least one portion of a structure in regard to claim 4, 7, 37 and 68

(e.g.; column 6, lines 39-47);

Optically sensing vibrations from different portions of a structure corresponding to similar elements of the structure comprising: comparing vibrations from different portions of a structure and determining whether a fault exists in a structure based on optically sensed structural vibrations based on comparing vibrations from different portions of a structure regarding claim 35

(e.g.; column 3, lines 55-58);

Optically sensing vibrations from different portions of a structure corresponding to similar elements of the structure comprising: comparing vibrations from different portions of a structure and determining whether a fault exists in a structure based on comparing peak displacements of vibrations in regard to claim 36

(e.g.; column 3, lines 55-58);

Optically sensing vibrations from different portions of a structure corresponding to similar elements of the structure comprising: comparing vibrations from different portions of a structure and determining whether a fault exists in a structure based on comparing peak velocity of vibrations in regard to claim 37

(e.g.; column 6, lines 39-54);

Optically sensing vibrations from a structure performed with a laser vibrometer in regard to claims 8 and 38

(e.g.; column 1, lines 4-11);

Optically sensing vibrations from a structure performed with a Doppler laser vibrometer in regard to claims 9 and 39

(e.g.; column 1, lines 4-11);

Determining whether a fault exists in a structure performed with a computer in regard to claims 10 and 40

(e.g.; column 7, lines 32-41);

Vibrating a structure regarding claim 43

(e.g.; column 2, lines 15-19);

Vibrating a structure by generating sonic waves regarding claim 48

(e.g.; column 2, lines 15-19);

Vibrating a structure by direct application of force in regard to claims 51, 52, 92 and 93

(e.g.; column 1, lines 58-62);

Determining a fault exists in a structure due to damage of a structure element in regard to claims 24 and 56

(e.g.; column 2, lines 38-50);

A structure element comprises at least one foundation, roof, ceiling, floor, wall, beam, column, support, joist, wall panel, wall frame, window, window frame, duct, plumbing, piping or hanger (stringer) regarding claims 25, 27, 29, 31, 57, 59, 61 and 63

(e.g.; column 10, lines 45-50);

Determining a fault exists in a structure due to deterioration of a structure element in regard to claims 26 and 58

(e.g.; column 1, lines 28-31);

Determining a fault exists in a structure due to due to dislocation or separation between structure elements in regard to claims 28 and 60

(e.g.; column 9, lines 1-10);

Determining a fault exists in a structure due to due to improper joining of structure elements in regard to claims 30 and 62

(e.g.; column 9, lines 1-10);

Optically sensing vibrations at spaced portions of a structure to produce a first set of vibration data readings in regard to claims 5, 32 and 70

(e.g.; column 3, lines 55-65);

Optically sensing vibrations at spaced portions of a structure to produce a first set of vibration data readings based on peak displacements of the vibrations in regard to claim 6

(e.g.; column 5, lines 1-6)

Generating a laser beam and transmitting a laser beam to a structure

regarding claims 2 and 33

(e.g.; column 4, lines 65-67 and column 5, lines 1-6; Figure 1);

Receiving a laser beam from a structure, the received beam shifted in phase relative to a transmitted beam due to a vibration of the structure regarding claim 33

(e.g.; column 4, lines 65-67 and column 5, lines 1-6; Figure 1);

Detecting a received beam phase shift in regard to claim 33

(e.g.; column 4, lines 65-67 and column 5, lines 1-6; Figure 1);

Determining at least one or both peak displacement and peak velocity of a vibration based on detecting a received beam phase shift in regard to claim 34

(e.g.; column 4, lines 65-67 and column 5, lines 1-6; Figure 1);

Comparing vibration data of a second set to vibration data of a first set to generate comparison result data from different portions of a structure corresponding to similar elements of a structure in regard to claims 32

(e.g.; column 3, lines 55-65);

Optically sensing vibrations at spaced portions of a structure to produce a first set of vibration data readings and optically sensing vibrations at spaced portions of a structure to produce a second set of vibration data readings at a time after completion of performing sensing of first set of vibration data regarding claim 32

(e.g.; column 2, lines 38-47);

Comparing vibration data of a second set with corresponding vibration data of a first set (baseline) to generate comparison result data performed by a computer regarding claim 41

(e.g.; column 3, lines 55-64; Figure 1);

Determining whether a fault exists in a structure, at the time of optically sensing vibrations at spaced portions of a structure to produce a second set of vibration data, based on comparison result data performed by a computer regarding claim 42

(e.g.; column 3, lines 55-65; Figure 1);

A system for detecting a fault in a structure comprising:

An optical vibration sensor (OVS) positioned in proximity to a structure in regard to claim 64

(e.g.; column 7, lines 32-50; Figures 1 and 3);

An OVS optically sensing vibration of a structure in regard to claim 64

(e.g.; column 7, lines 32-50; Figures 1 and 3);

An OVS generating an optical vibration sensor signal based on a sensed vibration from a structure in regard to claim 64

(e.g.; column 7, lines 32-50; Figures 1 and 3);

An OVS signal indicating whether a fault exists in a structure in regard to claim 64

(e.g.; column 7, lines 32-50; Figures 1 and 3);

A computer coupled to receive an OVS signal generates a display based on an OVS signal and is used by a user to determine whether a fault exists in a structure in regard to claim 65

(e.g.; column 7, lines 32-50; Figures 1 and 3);

A computer generating a signal to indicate that a fault exists in a structure if the signal indicates a peak displacement of a vibration at a portion of a structure exceeds threshold amount data stored in the computer in regard to claim 67

(e.g.; column 7, lines 32-50; Figures 1 and 3);

An OVS signal indicating whether a fault exists in a structure wherein:

A computer generates a signal to indicate that a fault exists in the structure if the computer determines that a signal indicates a peak velocity of a vibration at a portion of the structure exceeds threshold data stored in the computer in regard to claim 68

(e.g.; column 7, lines 32-50; Figures 1 and 3);

A computer stores an OVS signal having vibration data for different portions of a structure and determining a fault exists in a structure by comparison of vibration data for similar structure elements if the difference between data for similar structure elements exceeds threshold data stored in the computer regarding claim 69

(e.g.; column 7, lines 32-50; Figures 1 and 3);

An OVS generates a signal in a first performance of sensing to establish baseline data including vibration data readings at spaced portions of a structure regarding claim 70

(e.g.; column 7, lines 32-50; Figures 1 and 3);

An OVS generates a signal in a second subsequent performance of sensing to generate after-acquired data including vibration data readings at spaced portions of a structure in regard to claim 70

(e.g.; column 7, lines 32-50; Figures 1 and 3);

A computer comparing after-acquired data with corresponding baseline data and determining a fault exists in a structure if the difference between after-acquired and baseline data exceed threshold data stored in the computer in regard to claim 70

(e.g.; column 7, lines 32-50; Figures 1 and 3);

An output device coupled to a computer generates a printed document based on the computer signal in regard to claim 71

(e.g.; column 9, lines 34 et seq and column 10, lines 1-44;
Figures 1 and 3);

A computer comprises a drive unit for writing fault indication data onto a computer-readable medium based on a computer signal in regard to claim 72

(e.g.; column 9, lines 34 et seq and column 10, lines 1-44;
Figures 1 and 3);

An OVS controller coupled to receive a signal from the OVS generates a vibration signal indicating displacement of at least one portion of a structure in regard to claim 74

(e.g.; column 9, lines 58-63; Figures 1 and 3);

A computer coupled to receive an OVS signal generates a display based on an OVS signal and is used by a user to determine whether a fault exists in a structure further comprises:

An OVS controller coupled to receive a signal from an OVS generates a signal indicating vibration velocity of at least one portion of a structure in regard to claim 75

(e.g.; column 9, lines 58-63; Figures 1 and 3);

An OVS controller coupled to a computer to supply a signal indicating vibration velocity to the computer regarding claim 75

(e.g.; column 9, lines 58-63; Figures 1 and 3);

A computer coupled to receive an OVS signal generates a display based on the OVS signal and is used by a user to determine whether a fault exists in a structure further comprises:

An OVS controller operable to automatically focus the OVS on the structure regarding claim 76

(e.g.; column 5, lines 26-36);

A computer coupled to the position controller generates a signal and supplies signal to the position controller that generates a position signal based on the position control signal in regard to claim 80

(e.g.; column 6, lines 23-29; Figure 1);

And a vibration generator positioned proximate to a structure producing a vibration response in the structure wherein the vibration generator applies direct force to the structure in regard to claim 92
(e.g.; column 1, lines 58-62).

Webster does not fully teach:

A Vibration generator proximate to a structure producing vibrations that travel to and vibrate the structure regarding claim 86;

Vibrating ground in proximity to a structure resting on the ground to produce vibration in the structure, the structure being a house or building in regard to claims 44 and 88;

Vibrating the ground proximate to a structure by generating an explosion in regard to claims 15, 47 and 90;

Vibrating a structure using sonic waves generated by a speaker in regard to Claim 49 and 89;

Vibrating a structure using sonic waves generated by a helicopter; in regard to claims 50 and 91;

Vibrating a structure by exposure to wind loading in regard to claim 53;

A structure is a building in regard to claim 54;

A structure is a house in regard to claim 55;

A pan/tilt head coupled to an OVS in regard to claim 78;

An OVS comprised of a laser/sensor head in regard to claim 81;

A position controller coupled to a pan/tilt head generating a position signal and supplying a signal to the pan/tilt head to control alignment of the OVS relative to the structure in regard to claim 79;

Or a scan unit for scanning a laser beam generated by a laser/sensor head over different portions of a structure and receiving the scanned laser beam from different portions of the structure in regard to claim 85.

Savage teaches a method comprising:

A structure is a building regarding claim 54

(e.g.; column 3, lines 56-62)

Vibrating the ground proximate to a structure in regard to claims 44 and 86

(e.g.; column 9, lines 49-56; Figure 1);

Vibrating the ground with a ground vibrator regarding claims 14, 46 and 88

(e.g.; Figure1);

And vibrating a structure by exposure to wind loading in regard to claim 53

(e.g.; column 2, lines 52-57).

Regarding claims 1-10, 14, 24-44, 46, 48, 51-65, 67-72, 74-76, 80, 86, 88, 92 and 93, it would have been obvious to one skilled in the art at the time of the instant invention to modify the teaching of Webster of determining structural integrity by the teaching of Savage of vibrating the ground proximate to a structure (building) because determining structural integrity of buildings (such as schools) would have been of interest to those responsible for the safety and well-being of potential occupants (children) and vibrating the actual structure would not always have been economically or mechanically feasible. Further, a structure would have been coupled to the ground, in most cases, and vibrating the ground by a variety of conventional means such as ground vibrators, explosions and vehicle motors would have produced a vibration in the structure. Even further, the Savage reference suggests determining structural integrity of buildings and clearly a house would have been considered a building by one skilled in the art.

4 Claims 15, 47 and 90 are rejected under 35 U.S.C. 103(a) as being unpatentable over Webster in view of Savage and further in view of Littlejohn et al. (U.S. Patent Number 5,798,981)(Hereafter referred to as Littlejohn).

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The teachings of Webster and Savage have been previously discussed in paragraph 3 except for vibrating the ground proximate to a structure by generating an explosion.

Littlejohn teaches vibrating the ground proximate to a structure by generating an explosion in regard to claims 15, 47 and 90

(e.g.; column 5, line 65 et seq).

In regard to claims 15, 47 and 90, it would have been obvious to one skilled in the art at the time of the instant invention to modify the teaching of Webster of vibrating the structure by the teaching of Littlejohn of vibrating the ground proximate to the structure by generating an explosion because a ground vibration generated by an explosion would have produced an intense vibration of the structure that would have been difficult to produce by other vibration generating methods.

5 Claims 49 and 89 are rejected under 35 U.S.C. 103(a) as being unpatentable over Webster in view of Savage and further in view of Kaduchak et al. (U.S. Patent Number 6,186,004 B1)(Hereafter referred to as Kaduchak).

The teachings of Webster and Savage have been previously discussed in paragraph 3 except for sonic waves generated with a speaker.

Kaduchak teaches sonic waves generated with a speaker in regard to claims 49 and 89

(e.g.; column 1, lines 64-67 and column 2, lines 1-10).

Regarding claims 49 and 89, it would have been obvious to one skilled in the art at the time of the instant invention to modify the teaching of Webster of generating sonic waves by the teaching of Kaduchak of sonic waves generated with a speaker because generating sonic waves with a speaker would have allowed greater control of frequency and intensity than most other direct contact or ground coupled vibration generation methods and would have had, in most cases, greater portability.

6 Claims 50 and 91 are rejected under 35 U.S.C. 103(a) as being unpatentable over Webster in view of Savage and further in view of Becker, T J; "Picking Up Good Vibrations"; Georgia Technical Institute Research Horizons; May 2000 (Hereafter referred to as Becker).

The teachings of Webster and Savage have been previously discussed in paragraph 3 except for vibrating the structure by generating a sonic wave using the noise generated by a helicopter.

Becker teaches vibrating the structure by generating a sonic wave using the noise generated by a helicopter in regard to claims 50 and 91

(Page 1).

Regarding claims 50 and 91, it would have been obvious to one skilled in the art at the time of the instant invention to modify the teaching of Webster of vibrating the structure by the teaching of Becker of generating a sonic wave using the noise generated by a helicopter because a helicopter would have allowed access to and measurement of remote or difficult to reach structures, such as offshore energy production platforms, power-line structures or astronomical observatories, in a timely and cost-effective manner.

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7 Claims 77-79, 81 and 85 are rejected under 35 U.S.C. 103(a) as being unpatentable over Webster in view of Savage and further in view of Naiman J; "Laser Vibrometers Simplifying Bridge Condition Evaluation"; OE Reports; Volume 173; May 1998 (Hereafter referred to as Naiman).

The teachings of Webster and Savage have been previously discussed in paragraph 3 except for a tripod coupled to an OVS; a pan/tilt head coupled to an OVS; an OVS comprising a laser/sensor head; and a position controller coupled to the pan/tilt head generating a position signal and supplying the signal to the pan/tilt head to control alignment of the OVS relative to the structure.

Naiman teaches:

A tripod coupled to an OVS in regard to claim 77

(Figure 3);

A pan/tilt head coupled to an OVS in regard to claim 78

(Figure 3);

A position controller coupled to the pan/tilt head generating a position signal and supplying the signal to the pan/tilt head to control alignment of the OVS relative to the structure in regard to claim 79

(Figure 3);

An OVS comprising a laser/sensor head in regard to claim 81

(Figure 3);

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And a system for detecting fault in a structure comprising:

An OVS positioned proximate to a structure optically sensing vibration of the structure and generating a signal based on vibrations sensed from structure further comprising:

A scan unit for scanning a laser beam generated by a laser/sensor head over different portions of a structure and receiving the scanned laser beam from different portions of the structure in regard to claim 85

(e.g.; Figure 1 and 3);

Regarding claims 77-79, 81 and 85, it would have been obvious to one skilled in the art at the time of the instant invention to modify the teaching of Webster of optically sensing vibrations from a structure performed with a Doppler laser vibrometer by the teachings of Naiman of a tripod; a pan/tilt head; an OVS comprising a laser/sensor head; and a position controller coupled to the pan/tilt head because these were all commonly available elements that enhanced versatility and functionality of conventionally used vibration sensing equipment and systems.

Response to Amendment

8 Applicant amendments have overcome objections to claims 6, 7, 14, 25, 27, 29, 31, 57, 59, 61, 63, 70-72 and 74 in previous Office Action (paper 7).

Applicant filed corrected drawings 13 September 2002 of Figures 7B and 7F which overcome objections to Figures 7B and 7F in paper 7 and the corrected drawings are approved by the examiner.

Applicant amended claim 1 to include a limitation "**vibrating ground in proximity to a structure resting on the ground to produce vibration in the structure, the structure being a house or building**". Rejection of claim 1 under §102 (b) paper 7 is traversed by the amendment and is therefore withdrawn.

Response to Arguments

9 Applicant's arguments with respect to claims 1-10, 19, 24-43, 48, 51, 56-65, 67-72, 74-76, 80, 85 and 92 have been considered but are moot in view of the new ground(s) of rejection.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

In response to applicant's argument that the Webster and Savage references contain no disclosure that would have motivated a skilled artisan to combine their teachings to obtain the instant invention, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). The **combination** of the Webster and Savage references read on the broad limitations of the instant invention in claims 1-10, 14, 24-44, 46, 48, 51-65, 67-72, 74-76, 80, 86, 88, 92 and 93.

In regard to applicant's argument that neither Webster nor Savage discloses vibrations induced in a structure by bumping into the structure with a vehicle examiner directs applicants attention to, for example, Savage reference column 2, lines 52-57 where Savage discloses "...**structure is exposed to...loads from tender vessels...**" which clearly would have been considered vibrations induced in a structure by bumping into the structure with a vehicle.

In regard to applicant's argument that neither Webster nor Savage discloses vibrations induced in a structure by wind loading examiner directs applicants attention to, for example, Savage reference column 2, lines 52-57 where Savage discloses "...**structure is exposed to...wind and gust loads ...**" which clearly would have been considered vibrations induced in a structure by wind loading.

Applicant argues Webster references fails to disclose a structure that is a building or a house and that the Savage reference discloses a building but not a house. Examiner notes the combination of Webster and Savage discloses structures that are buildings and further that the terms house, building and structure would have been considered synonymous at the time of the instant invention.

Applicant argues that there would have been no motivation for a skilled artisan to combine the Webster, Savage and Kaduchak references at the time of the instant invention to arrive at a method of vibrating a structure using a speaker proximate to the structure. Examiner notes that the science of architectural acoustics was well developed prior to the instant invention. Architectural acousticians analyze the vibratory response of structures to sound (acoustic waves) and would have used many different methods of sound generation such as musical instruments, persons (singers) and speakers to establish sound fields to aid in their analysis. In addition, the applicant argues that the Kaduchak reference is vague in regard to the nature of the transducers disclosed by the Kaduchak reference. Examiner directs applicant's attention to, for example, Kaduchak column 1, lines 64-67 and column 2, lines 1-10 where **Kaduchak discloses using speakers to establish vibration in proximate structures as PRIOR ART**. The combination of Webster, Savage and Kaduchak clearly reads on the broad claimed limitations of the instant invention.

Applicant argues that the Littlejohn reference fails to teach detection of faults in a structure such as a building or a house. Examiner notes the combination of Webster, Savage and Littlejohn reads on the broad claim limitations and clearly suggests determining structural fault detection using explosions (blasts) to establish vibrations (e.g.; column 6, lines 2-6).

Applicant argues that there would have been no motivation for a skilled artisan to combine Webster, Savage and Becker to achieve a method of using a helicopter to establish a vibratory response in a structure. Examiner maintains that **the combination** of Webster, Savage and Becker read on the broad claim limitations of the instant invention because the Becker reference in combination with Webster and Savage clearly does disclose a method of optically sensing vibratory response of a structure using helicopter.

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Applicant argues the combination of Webster, Savage and Naiman fails to teach a system for detecting structural faults using an OVS comprising a tripod coupled to the OVS, a pan/tilt head coupled to the OVS and a position controller coupled to the pan/tilt head. Applicant also argues that Naiman is measuring cable tension and therefore teaches away from the claimed invention. Examiner notes that Figure 3 of Naiman clearly discloses a tripod, a pan/tilt head coupled to an OVS and a position controller. Further Naiman discloses prior art using algorithms to relate cable vibrations to tension so clearly the Naiman reference is disclosing a method of measuring a vibratory response of a structure using an OVS to determine structural faults.

Applicant argues the Polytec reference fails to disclose an optical filter and that the Webster, Savage and Polytec combination fails to disclose the claimed limitations of the instant invention. Examiner notes the Polytec reference fails to disclose an optical filter.

Conclusion

10 Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas N Washburn whose telephone number is 703 308-2854. The examiner can normally be reached on Monday through Thursday 6:30 AM - 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E Barlow can be reached on 703 308-3126. The fax phone numbers for the organization where this application or proceeding is assigned are 703 872-9318 for regular communications and 703 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308-0956.

DNW

October 21, 2002


John Barlow
Supervisory Patent Examiner
Technology Center 2800